

CLAIMS

What is claimed is:

1. A golf ball comprising:
 - a multi-layer core having:
 - a center having a Shore C surface hardness of less than about 80 and a compression of less than 70,
 - at least one rigid outer core layer having a flex modulus greater than 40,000 psi and a Shore C hardness of greater than 80;
 - an intermediate core layer interposed between the center and the rigid outer core layer comprised of a fully neutralized ionomer, and having a flex modulus less than 20,000 psi and a Shore C hardness less than 60; and
 - a cover having a Shore D hardness of less than 65.
2. The golf ball according to claim 1, wherein the ball is comprised of a plurality of intermediate core layer with flex moduli that progressively increase.
3. The golf ball according to claim 1, wherein the center has a Shore C hardness of less than 60.
4. The golf ball according to claim 1, wherein at least one rigid outer core layer has a Shore C hardness of greater than 85.
5. The golf ball according to claim 1, wherein the cover has a Shore D hardness of less than 60.
6. The golf ball according to claim 1, wherein the multi-layer core has a diameter greater than 1.60 inches.
7. The golf ball according to claim 1, wherein each core layer has a thickness from about 0.015 to 0.05 inches.

8. The golf ball according to claim 1, wherein the ionomer comprises a polymer fully neutralized by an organic salt.
9. The golf ball according to claim 8, wherein the organic salt is selected from the group consisting of barium, lithium, sodium, zinc, bismuth, potassium, strontium, magnesium or calcium salts.
10. The golf ball according to claim 1, wherein the ionomer comprises a polymer containing an acid group, a base, and an organic acid or a salt thereof, the base and the organic acid or salt thereof being present in sufficient amounts such that the polymer is fully neutralized.
11. The golf ball according to claim 10, wherein the organic acid is selected from the group consisting of caproic, caprylic, capric, lauric, stearnic, behenic, erucic, oleic, and linoleic acids.
12. A golf ball comprising:
a multi-layer core having:
a center,
at least one rigid outer core layer having a flex modulus greater than 40,000 psi and a Shore C hardness of greater than 80,
an intermediate core layer comprised of a fully neutralized ionomer, and interposed between the center and the rigid outer core layer, having a flex modulus less than 20,000 psi and a Shore C hardness less than 60; and
a cover having a Shore D hardness of less than 65.
13. The golf ball according to claim 12, wherein the center has a compression of less than 50.
14. The golf ball according to claim 12, wherein the center has a Shore C hardness of less than 60.

15. The golf ball according to claim 12, wherein at least one rigid outer core layer has a Shore C hardness of greater than 85.
16. The golf ball according to claim 12, wherein the cover has a Shore D hardness of less than 60.
17. The golf ball according to claim 12, wherein the mult-layer core has a diameter greater than 1.55 inches.
18. The golf ball according to claim 12, wherein the outer core layer has a thickness from about 0.015 to 0.05 inch.
19. The golf ball according to claim 12, wherein the center has a specific gravity of less than 1.1 g/cc.
20. The golf ball according to claim 12, wherein at least one of the core layers has a specific gravity of greater than 1.25 g/cc.
21. The golf ball according to claim 20, wherein the at least one of the core layers is the outermost core layer.
22. The golf ball according to claim 12, wherein at least one of the core layers has a specific gravity of greater than 1.50 g/cc.
23. The golf ball according to claim 12, wherein at least one of the core layers has a specific gravity of greater than 1.75 g/cc.
24. The golf ball according to claim 12, wherein the ionomer comprises a polymer fully neutralized by an organic salt.

- 25.** The golf ball according to claim 24, wherein the organic salt is selected from the group consisting of barium, lithium, sodium, zinc, bismuth, potassium, strontium, magnesium or calcium salts.
- 26.** The golf ball according to claim 12, wherein the ionomer comprises a polymer containing an acid group, a base, and an organic acid or a salt thereof, the base and the organic acid or salt thereof being present in sufficient amounts such that the polymer is fully neutralized.
- 27.** The golf ball according to claim 26, wherein the organic acid is selected from the group consisting of caproic, caprylic, capric, lauric, stearnic, behenic, erucic, oleic, and linoleic acids.